

See "Instructions for Filling out the Work Permit" contained in the Work Planning and Control for Experiments and Operations Subject Area.

**1. Work request WCC fills out this section.**

☐ Standing Work Permit

Requester: Don Lynch	Date:	Ext.: 2253	Dept/Div/Group: PO/PHENIX
Other Contact person (if different from requester): Carter Biggs			Ext.: 7515
Work Control Coordinator: Don Lynch		Start Date: 11/5/2012	Est. End Date: 11/16/2012
Brief Description of Work: Add additional support to MulD Collar Holding Area in IR			
Building: 1008	Room: IR	Equipment: MulD Collar Support Area	Service Provider: Carpenters and PHENIX Technicians

**2. WCC, Requester/Designee, Service Provider, and ESS&H (as necessary) fill out this section or attach analysis**

<b>ESS&amp;H ANALYSIS</b>			
<b>Radiation Concerns</b>	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Activation	<input type="checkbox"/> Airborne
	<input type="checkbox"/> Contamination	<input type="checkbox"/> Radiation	<input type="checkbox"/> NORM
	<input type="checkbox"/> Other		
<input type="checkbox"/> Special nuclear materials involved, notify Isotope Special Materials Group			
<input type="checkbox"/> Fissionable/Radiological materials involved, notify Laboratory Nuclear Safety Officer			
<b>Radiation Generating Devices:</b>	<input type="checkbox"/> Radiography	<input type="checkbox"/> Moisture Density Gauges	<input type="checkbox"/> Soil Density Gauges
	<input type="checkbox"/> X-ray Equipment		
<b>Safety and Security Concerns</b>	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Explosives	<input type="checkbox"/> Transport of Haz/Rad Material
	<input type="checkbox"/> Pressurized Systems		
<input type="checkbox"/> Adding/Removing Walls or Roofs	<input type="checkbox"/> Critical Lift	<input type="checkbox"/> Fumes/Mist/Dust*	<input type="checkbox"/> Magnetic Fields*
<input type="checkbox"/> Asbestos*	<input type="checkbox"/> Cryogenic	<input type="checkbox"/> Heat/Cold Stress	<input type="checkbox"/> Nanomaterials/particles*
<input type="checkbox"/> Beryllium*	<input type="checkbox"/> Electrical	<input type="checkbox"/> Hydraulic	<input type="checkbox"/> Noise*
<input type="checkbox"/> Biohazard*	<input type="checkbox"/> Elevated Work	<input type="checkbox"/> Lasers*	<input type="checkbox"/> Non-ionizing Radiation*
<input type="checkbox"/> Chemicals/Corrosives*	<input type="checkbox"/> Excavation	<input type="checkbox"/> Lead*	<input type="checkbox"/> Oxygen Deficiency*
<input type="checkbox"/> Confined Space*	<input type="checkbox"/> Ergonomics*	<input type="checkbox"/> Material Handling	<input type="checkbox"/> Penetrating Fire Walls
	<input type="checkbox"/> Vacuum		
* Safety Health Rep. Review Required <input type="checkbox"/> Haz, Rad, Bio Material Exceed DOE 151.1-C Levels - Contact OEM <input type="checkbox"/> Other			
<b>Environmental Concerns</b>		<input checked="" type="checkbox"/> None	<input type="checkbox"/> Work impacts Environmental Permit No.
<input type="checkbox"/> Atmospheric Discharges (rad/non-rad)	<input type="checkbox"/> Land Use Institutional Controls	<input type="checkbox"/> Soil Activation/contamination	<input type="checkbox"/> Waste-Mixed
<input type="checkbox"/> Chemical or Rad Material Storage or Use	<input type="checkbox"/> Liquid Discharges	<input type="checkbox"/> Waste-Clean	<input type="checkbox"/> Waste-Radioactive
<input type="checkbox"/> Cesspools (UIC)	<input type="checkbox"/> Oil/PCB Management	<input type="checkbox"/> Waste-Hazardous	<input type="checkbox"/> Waste-Regulated Medical
<input type="checkbox"/> High water/power consumption	<input type="checkbox"/> Spill potential	<input type="checkbox"/> Waste-Industrial	<input type="checkbox"/> Underground Duct/Piping
Waste disposition by: <input type="checkbox"/> Other			
<b>Pollution Prevention (P2)/Waste Minimization Opportunity:</b>		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
<b>FACILITY CONCERNS</b>		<input checked="" type="checkbox"/> None <input type="checkbox"/> Intermittent Energy Release	
<input type="checkbox"/> Access/Egress Limitations	<input type="checkbox"/> Electrical Noise	<input type="checkbox"/> Potential to Cause a False Alarm	<input type="checkbox"/> Vibrations
	<input type="checkbox"/> Impacts Facility Use Agreement	<input type="checkbox"/> Temperature Change	<input type="checkbox"/> Other
<input type="checkbox"/> Configuration Management	<input type="checkbox"/> Maintenance Work on Ventilation Systems	<input type="checkbox"/> Utility Interruptions	
<b>WORK CONTROLS</b>			
<b>Work Practices</b>			
<input type="checkbox"/> None	<input type="checkbox"/> Exhaust Ventilation	<input type="checkbox"/> Lockout/Tagout	<input type="checkbox"/> Spill Containment
	<input type="checkbox"/> Security (see Instruction Sheet)		
<input checked="" type="checkbox"/> Back-up Person/Watch	<input type="checkbox"/> HP Coverage	<input type="checkbox"/> Posting/Warning Signs	<input type="checkbox"/> Time Limitation
	<input type="checkbox"/> Other		
<input checked="" type="checkbox"/> Barricades	<input type="checkbox"/> IH Survey	<input type="checkbox"/> Scaffolding-requires inspection	<input type="checkbox"/> Warning Alarm (i.e. "high level")
	<input type="checkbox"/> Electrical Inspection Required		
<b>Personal Protective Equipment</b>			
<input type="checkbox"/> None	<input type="checkbox"/> Ear Plugs	<input checked="" type="checkbox"/> Gloves as appropriate	<input type="checkbox"/> Lab Coat
	<input checked="" type="checkbox"/> Safety Glasses as appropriate		
<input type="checkbox"/> Coveralls	<input type="checkbox"/> Ear Muffs	<input type="checkbox"/> Goggles	<input type="checkbox"/> Respirator*
	<input type="checkbox"/> Safety Harness		
<input type="checkbox"/> Disposable Clothing	<input type="checkbox"/> Face Shield	<input type="checkbox"/> Hard Hat	<input type="checkbox"/> Shoe Covers
	<input checked="" type="checkbox"/> Safety Shoes	<input type="checkbox"/> High visibility cloths/vest	<input type="checkbox"/> Other
<b>Permits Required</b> (Permits must be valid when job is scheduled.)			
<input checked="" type="checkbox"/> None	<input type="checkbox"/> Cutting/Welding	<input type="checkbox"/> Impair Fire Protection Systems	
<input type="checkbox"/> Concrete/Masonry Penetration	<input type="checkbox"/> Digging/Core Drilling	<input type="checkbox"/> Rad Work Permit-RWP No	
<input type="checkbox"/> Confined Space Entry	<input type="checkbox"/> Electrical Working Hot	<input type="checkbox"/> Other	
<b>Dosimetry/Monitoring</b>			
<input checked="" type="checkbox"/> None	<input type="checkbox"/> Heat Stress Monitor	<input type="checkbox"/> Real Time Monitor	<input type="checkbox"/> TLD
<input type="checkbox"/> Air Effluent	<input type="checkbox"/> Noise Survey/Dosimeter	<input type="checkbox"/> Self-reading Pencil Dosimeter	<input type="checkbox"/> Waste Characterization
<input type="checkbox"/> Ground Water	<input type="checkbox"/> O <sub>2</sub> /Combustible Gas	<input type="checkbox"/> Self-reading Digital Dosimeter	<input type="checkbox"/> Other
<input type="checkbox"/> Liquid Effluent	<input type="checkbox"/> Passive Vapor Monitor	<input type="checkbox"/> Sorbent Tube/Filter Pump	
<b>Training Requirements</b> (List specific training requirements)			
<b>C-A User or equiv. , PHENIX Awareness</b>			
Based on analysis above, the Review Team determines the risk, complexity, and coordination ratings below:		If using the permit when all hazard ratings are low, only the following need to sign: ( Although allowed, there is no need to use back of form)	
<b>ESS&amp;H Risk Level:</b>	<input checked="" type="checkbox"/> Low <input type="checkbox"/> Moderate <input type="checkbox"/> High	WCC: Don Lynch	Date:
<b>Complexity Level:</b>	<input checked="" type="checkbox"/> Low <input type="checkbox"/> Moderate <input type="checkbox"/> High	Service Provider:	Date:
<b>Work Coordination:</b>	<input checked="" type="checkbox"/> Low <input type="checkbox"/> Moderate <input type="checkbox"/> High	Authorization to start Don Lynch	Date:
(Department/Division, or their equivalent, Sup/WCC/Designee)			

**3. Both work requester and service provider contribute to work plan (use attachments for detailed plans)****Work Plan** (procedures, timing, equipment, scheduling, coordination, notifications, and personnel availability need to be addressed in adequate detail): See Attached

Special Working Conditions Required (e.g., Industrial Hygiene hold points or other monitoring)

None

Notifications to operations and Operational Limits Requirements: None

Post Work Testing, Notification or Documentation Required:

Job Safety Analysis Required: ☐ Yes ☒ NoReview Done: ☒ in series ☐ team**Reviewed by:** \* Primary Reviewer signature means that the Review Team members were appropriate for the work that was planned, the Team visited the job site, hazards and risks that could impact ESS&H have been considered and controls established according to BNL requirements. In addition, this signature indicates that applicable JRAs, FRAs, as well as other planning documents have been reviewed and training requirements have been identified and recorded on this permit.

Title	Name (print)	Signature	Life #	Date
ES&H Professional				
F&O Facility Project Manager				
Service Provider				
Work Control Coordinator	Don Lynch		20146	
Safety Health Representative				
Research Space Manager				
Other				
Other (PHENIX Escort)				
Required Walkdown Completed				
*Primary Reviewer				

**4. Job site personnel (Supervisor and workers) fill out this section.**

Note: Signature indicates personnel performing work have read and understand the hazards and permit requirements (including any attachments) and all training required for this permit is current/complete. Job Supervisor/Contractor Supervisor signatures also includes verification that worker training required for this permit is current/complete.

Job Supervisor:		Contractor Supervisor:	
Workers:	Life#:	Workers :	Life#:

Workers are encouraged to provide feedback on ESS&amp;H concerns or on ideas for improved job work flow. Use feedback form or space below.

**5. Department/Division, or their equivalent, Line Manager or Designee**

Conditions are appropriate to start work: (Permit has been reviewed, work controls are in place and site is ready for job.)

Name:	Signature:	Life#:	Date:
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**6. Worker provides feedback.****Worker Feedback (use attached sheets as necessary)**a) WCM/WCC: Are there any changes as a result of worker feedback? ☐ Yes ☐ No

Note: See Work Planning and Control for Experiments and Operations Subject Area section 2.6.

**7. Post Job Review/Closeout: Work Control Coordinator (authorizing dept.) checks quality of completed permit and ensures the work site is left in an acceptable condition. (WCC can delegate clean up of job site to work supervisor.)** The WCC ensures that the change process to update drawings, placards, postings, procedures, etc., is initiated, if necessary.

Name:	Signature:	Life#:	Date:
Comments:			

**MuID Collar Holding support Upgrade****INTRODUCTION**

The MuID collars are large heavy semi-cylindrical steel structures which are normally bolted to the south end of the Muon South Magnet (MMS) and surround the beampipe. The collars provide shielding against unwanted signals from the PHENIX IP to the Muon ID detectors.

Each shutdown the MuID collars must be removed to allow the MMS magnet to be moved south providing access to interior PHENIX detector components. The MuID collars are too large, however, to be transported completely out of the IR unless the East Carriage (EC) is moved out of the IR. The EC can not be moved out of the IR unless the MMS is moved south.

This “choreography” dilemma is addressed by having a small dedicated area in the southeast corner of the IR where the Collars can be stored temporarily after removal, thus allowing the MMS to be moved south, which in turn allows the EC to be moved to the Assembly Hall (AH).

The area where the collars are temporarily stored is raised from the IR floor to the level of the PHENIX track system using jackposts, aluminum i-beams and aluminum channels for structural support under a steel grating which allows venting for the area below the tracks, thus preventing accumulation of gases.

Currently the far west side of this area is insufficiently supported resulting in some damage to the grating. While imminent failure of the support structure is not indicated, the damage to the grating would become progressively worse, if not addressed to the point where failure of the support structure would become likely.

PHENIX engineering has determined that an additional aluminum i-beam and aluminum channels can easily be added to the existing support structure to address this situation. The details are provided below.

**Procedures**

***All work described herein shall be coordinated and performed by PHENIX technicians and BNL bargaining unit carpenters as appropriate to the task and per bargaining unit contract with BNL. All working personnel shall have appropriate skills and training to accomplish the work described herein. All workers shall have and wear the appropriate personal protective equipment (PPE) for each task.***

1. Prior to starting work on this upgrade, a barricade or other equivalent appropriate measures shall be provided around the work area to prevent potential fall accidents into the area while the grating is removed.
2. Remove the grating.
3. Remove the thin steel angles separating the gratings on the west end of the support structure.
4. Install the jack posts, ibeam and channels per the sketches below.
5. Make sure that the jack posts are set such that the grating will sit flat and level on all support surfaces.

6. Re-install the grating.
7. Upon completion of this project, all work permit paperwork shall be completed, all unexpected problems and their solutions shall be recorded along with any other appropriate observations.

## MuID Collar IR Holding Area Support



Existing Structural Support provided by aluminum i-beams supported at each end by jackposts (which also adjust for height) and a central channel. On top of these are grated covers (not shown). Existing support does not extend all the way west end of holding area.

Existing Support structure

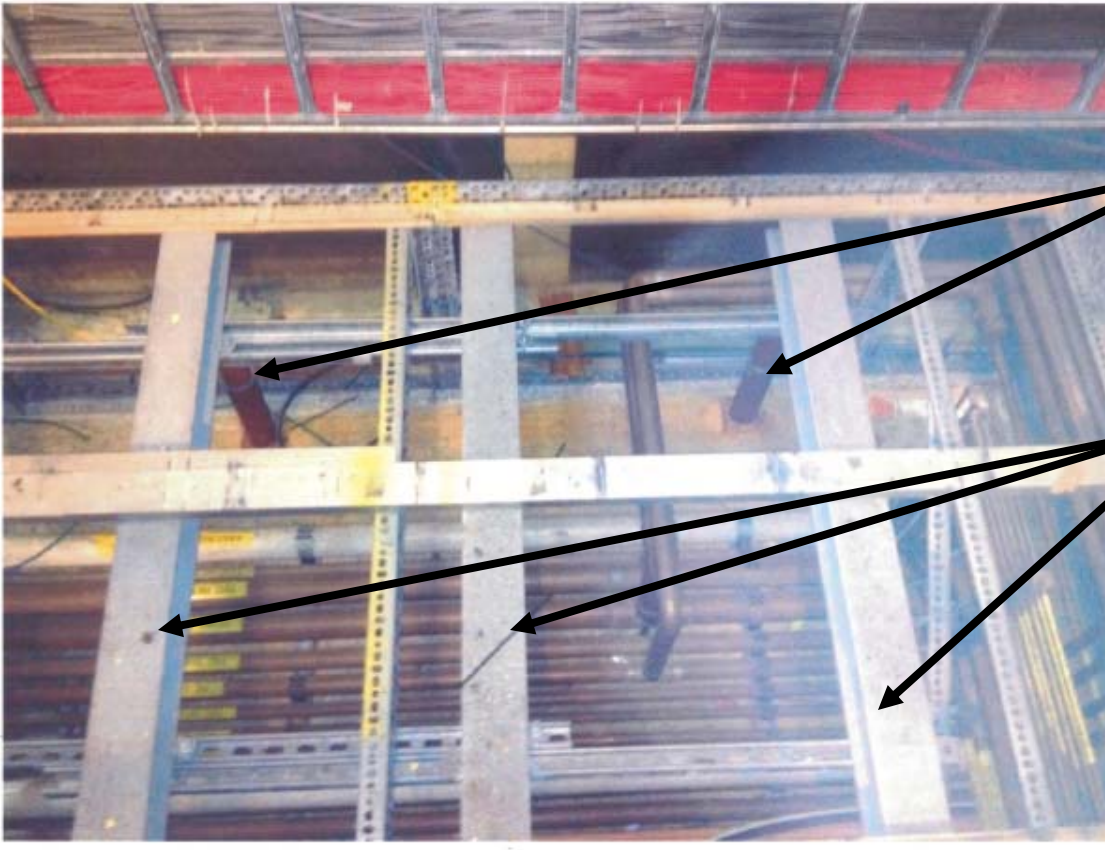


Existing Structural support:

Jack posts

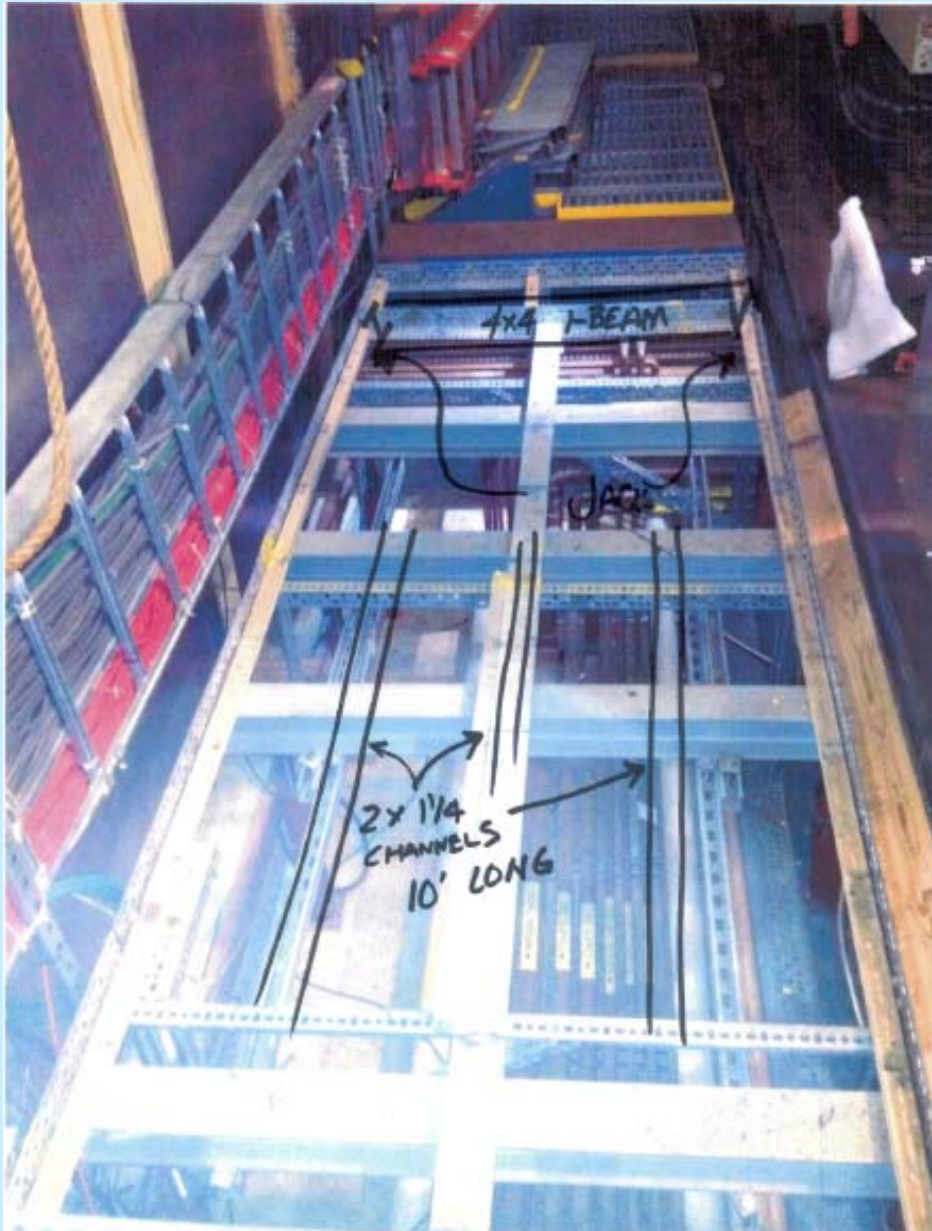
Channel

Ibeams





Height adjustment and load path to floor through "REDIPOST" jack posts under both ends of i-beams



New collar support structure adds 2 additional channels (full length) plus an ibeam supported by 2 jack posts at the west end of the support area. This will improve weight distribution and prevent damage to the west end of the grating (not shown) as has been occurring.